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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/652,998	08/31/2000	D. Mark Durcan	98-1068.06	4016

7590 09/24/2002

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EXAMINER

MAI, ANH D

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 09/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/652,998

Applicant(s)

DURCAN ET AL.

Examiner

Anh D. Mai

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 June 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13, 14, 67 and 68 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13, 14, 67 and 68 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 24, 2002 has been entered.

Amendment

2. Amendment filed June 24, 2002 has been entered as Paper No. 12. Claims 13, 67 and 68 have been amended. Claims 13, 14, 67 and 68 are pending.

Response to Amendment

3. The amendment filed June 24, 2002 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: “the top capacitor plate includes a lateral clearance opening at the first level around the contact and does not vertically descend between the first, second and third bottom capacitor plates and the contact” ; “the bit line contact downwardly extends from a vertical height above a top of the first and second bottom electrodes” and “wherein the top electrode includes a lateral clearance opening above the top of the first bottom electrode”.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 13, 14, 67 and 68 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

There does not appear to be a written description of the claim limitations in the application as filed.

a) the top capacitor plate includes a lateral clearance opening at the first level around the contact and does not vertically descend between the first, second and third bottom capacitor plates and the contact (claim 13, lines 13-14).

As shown in Fig. 12, the top capacitor plate 24c lining the trench between the second and third bottom capacitor plates (middle of the drawing). Clearly, the top capacitor plate 24C is vertically descent between the second and third bottom capacitor plates.

As best understood by the examiner, the top capacitor plate is vertically descent between the second and third bottom capacitor plates.

b) the bit line contact downwardly extends from a vertical height above a top of the first and second bottom electrodes (claims 13, line 6-7 and claims 67; 68, lines 4-6, respectively).

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As best understood by the examiner, the bit line contact is downwardly extends from a vertical height above the *contact area* only.

c) wherein the top electrode includes a lateral clearance opening above the top of the first bottom electrode (claim 67, lines 10-11).

The opening is formed above the bit line *contact area* only.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 13, 14, 67 and 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Becker (U.S. Patent No. 5,770,498) (cited previously).

With respect to claim 13, as best understood by the examiner, Becker teaches an array of capacitors substantially similar as claimed including:

a first bottom capacitor plate (44);

a second bottom capacitor plate (44);

a third bottom capacitor plate (44); (not shown);

a contact (54) between the first bottom capacitor plate and the second bottom capacitor plate, the contact downwardly extends from a vertical height above a contact area (32B);

a trench between the second bottom capacitor plate (44) and the third bottom capacitor plate (44);

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a common top capacitor plate (50) over the first bottom capacitor plate (44), the second bottom capacitor plate (44), and the third bottom capacitor plate (44), wherein the top capacitor plate (50) extends toward the contact (54) at a first level within the array, the top capacitor plate (50) includes a lateral clearance opening at the first level around the contact (54) and vertically descent between the second and third bottom capacitor plates (44), and wherein the top capacitor plate (50) lines a side of the trench and further lines a bottom of the trench at a second level within the array; and

a dielectric (46) between the top capacitor plate (50) and the first, second, and third bottom capacitor plates (44). (See Fig. 10).

The third bottom capacitor plate (44) is not shown but can be understood as on the outside (left and right) of the first and second bottom capacitor plates (44) since the capacitors of Becker are formed in an array.

With respect to claim 14, the top capacitor plate (50) extends toward the top of the contact (32B).

With respect to claim 67, as best understood by the examiner, Becker teaches an array of capacitor substantially as claimed including:

first, second and third memory cell capacitors comprising first, second and third bottom (not shown) container-shaped electrodes (44), respectively;

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a bit line contact (54) laterally positioned between the first and second memory cell, the bit line contact downwardly extends from a vertical height above a contact area (32B);

a trench laterally positioned between the second (44) and third (not shown) bottom electrodes;

a common top electrode (50) capacitively coupled to the first, second and third electrodes (44) via a capacitor dielectric layer (46), wherein the top electrode (50) includes a lateral clearance opening around the bit line contact, the top electrode (50) is capacitively coupled to an interior of the first, second and third bottom electrodes (44) and a portion of the exterior of the second and third bottom electrodes (44) located in the trench; and

a bit line contact insulation region (36) surrounding the bit line contact (54) and filling a region between the bit line contact (54) and the bottom electrodes (44). (See Fig. 10).

The third bottom capacitor plate (44) is not shown but can be understood as on the outside (left and right) of the first and second bottom capacitor plates (44) since the capacitors of Becker are formed in an array.

With respect to claim 68, as best understood by the examiner, Becker teaches an array of capacitor substantially as claimed including:

first, second and third memory cell capacitors comprising first, second and third bottom (not shown) container-shaped electrodes (44), respectively;

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a bit line contact (54) laterally positioned between the first and second memory cell, the bit line contact downwardly extends from a vertical height above a top of the first and second bottom electrodes (44);

a trench laterally positioned between the second (44) and third bottom electrodes (not shown);

a common top electrode (50) capacitively coupled to the first, second and third electrodes (44) via a capacitor dielectric layer (46), wherein the top electrode (50) includes a lateral clearance opening around the bit line contact, the top electrode (50) is capacitively coupled to an interior of the first, second and third bottom electrodes (44) and a portion of the exterior of the second and third bottom electrodes (44) located in the trench; and

a bit line contact insulation region (36) surrounding the bit line contact (54) and filling a region between the bit line contact (54) and the first and second bottom electrodes (44), wherein the bit line contact insulation region (36) prevents the top electrode (54) from downwardly extending between the bit line contact (54) and the first and second bottom electrodes (44). (See Fig. 10).

The third bottom capacitor plate (44) is not shown but can be understood as on the outside (left and right) of the first and second bottom capacitor plates (44) since the capacitors of Becker are formed in an array.

Response to Arguments

6. Applicant's arguments filed June 24, 2002 have been fully considered but they are not persuasive.

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Regarding claim 13, the amended claims contain new matter: top capacitor plate **does not** vertically descent between the second and third.

If top capacitor plate **does not** vertically descent between the second and third, then, how can "the top capacitor plate lines a side of said trench" (lines 14-15).

7. Applicant's arguments with respect to claims 67 and 68 have been considered but are moot in view of the new ground(s) of rejection.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anh D. Mai whose telephone number is (703) 305-0575. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703) 306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

A.M
September 20, 2002


OLIK CHAUDHURI
SUPERVISORY PATENT EXAMINER
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